
Microfluidic image cytometry.

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Public Summary:

Cell-based arrays offer powerful tools for genomics/proteomics and drug discovery, and are widely applicable for most cell lines. However, it is challenging to apply cell-based arrays for in vitro diagnosis due to limited amount of patient samples. Here, we utilized and demonstrated microfluidic image cytometry (MIC), capable of quantitative, single-cell profiling of multiple signaling molecules using only 300-3,000 cells from clinical brain tumor specimens for in vitro molecular diagnosis. First, we characterized the PI3K/AKT/mTOR pathway, which is often over-activated in the brain tumors, in U87 brain tumor cell lines by measuring EGFR, PTEN, pAKT, and pS6 with a MIC platform, and applied this measurement to clinical brain tumor specimens. In conjunction with statistical analysis, we were able to characterize extensive inter- and intra-tumoral molecular heterogeneity.

Scientific Abstract:

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